

Gastric Emptying following Colles' fracture

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SUMMARY

There are few complications associated with intravenous regional anaesthesia but convulsions with loss of consciousness induced by local anaesthetic toxicity may result in pulmonary aspiration. In many hospitals, patients are fasted prior to the procedure although such a delay would be of little value if gastric emptying was inhibited following painful injury.

Utilizing the kinetics of paracetamol absorption, we investigated the rate of gastric emptying in patients sustaining a Colles' fracture within the previous 4 h. Post-manipulation control values were obtained at their first out-patient attendance. There was no statistically significant difference in the rate of gastric emptying.

Since gastric emptying is not delayed by a recent Colles' fracture, the simple precaution of fasting patients prior to intravenous regional anaesthesia should reduce the risk of pulmonary aspiration.

INTRODUCTION

Colles' fractures occur most commonly in elderly women and are often treated by closed manipulation under intravenous regional anaesthesia (IVRA) (Hunt *et al.*, 1984). Prior fasting is usually advised although it is generally assumed that gastric emptying is delayed by the pain of injury. We have investigated the rate of gastric emptying following Colles' fracture.

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PATIENTS AND METHODS

Nine otherwise healthy women, aged 50–80 years (mean 66.9 (SD 8.7)), who were admitted to the Accident and Emergency Department of the Royal Infirmary, Edinburgh having sustained a Colles' fracture within the previous 4 h, were studied. Patients who had taken solids within 2 h or liquids within 1 h were excluded. Patients concurrently receiving analgesics or medication for gastrointestinal disorders were also excluded.

Prior to fracture manipulation under IVRA with 0.5% Prilocaine, the rate of gastric emptying was measured indirectly by absorption of oral paracetamol. Gastric emptying determines the rate of paracetamol absorption because it is not absorbed from the stomach but is rapidly absorbed from the upper small intestine (Heading *et al.*, 1973). Each patient was given 1.5 g of paracetamol as 3 Panadol tablets with 200 ml of water and venous blood was sampled via an indwelling cannula in the uninjured arm at 0, 15, 30, 45, 60, 90 and 120 min thereafter. Plasma paracetamol concentrations were measured by high performance liquid chromatography.

Post manipulation control values for each patient were obtained at their first out-patient attendance when a second absorption test was performed. The patients were instructed not to take paracetamol in the previous 12 h.

The kinetics of paracetamol absorption were assessed by the maximum plasma concentrations (C max) and the time taken to reach this concentration (T max). In addition, the area under the plasma concentration time curve (AUC) from 0–60 min was calculated.

The Wilcoxon Rank pair test was used to assess the significance of the differences between the initial values at presentation and the subsequent control study. A *P* value of <0.05 was taken to be statistically significant.

RESULTS

The mean plasma paracetamol concentrations are shown in Figure 1. In three patients, paracetamol was present in blood samples drawn before dosing in the follow-up control study. The mean C max was 37.3 (SE 3.8) mg l^{-1} after injury prior to manipulation and 37.6 (SE 2.5) mg l^{-1} in the subsequent control study. The corresponding T max values were 50.0 (SE 10.6) and 36.7 (SE 10.3) min. The AUC from 0–60 min was 1238 (SE 238) mg l^{-1} per min before manipulation of the fracture compared with 1553 (SE 112) mg l^{-1} per min at follow-up. None of these differences were statistically significant.

DISCUSSION

Gastric emptying is influenced by physiological, pathological and pharmacological factors (Marsh *et al.*, 1984). The effect of pre-operative fasting on gastric emptying

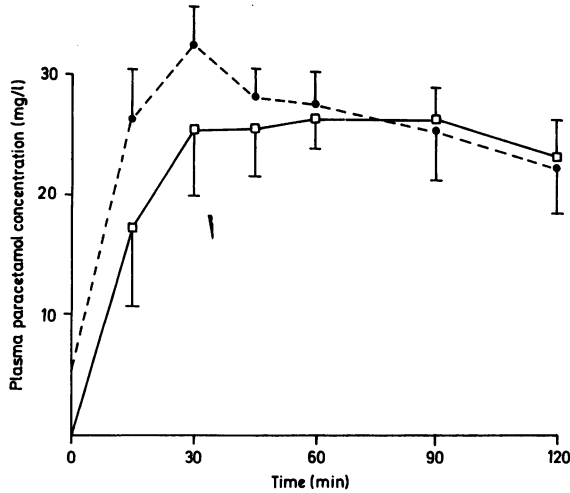


Fig. 1. Mean paracetamol concentrations (SE) before manipulation (□—□) of Colles' fracture and in the control study (●---●).

is unpredictable and in many hospitals, patients are fasted for at least 4 h before IVRA. Such a delay would be of little value in reducing the risk of vomiting and pulmonary aspiration if gastric emptying was inhibited following painful injury.

This study demonstrates that Colles' fracture does not significantly inhibit gastric emptying. Mechanical immobilization of a fracture has been previously shown to minimize the delay in gastric emptying following injury (Zaricznyj *et al.*, 1977), although this has been contested (Marsh *et al.*, 1984). In all our patients, the wrist was temporarily splinted and analgesia was not required.

There are a few complications with IVRA but convulsions with loss of consciousness induced by local anaesthetic toxicity may result in pulmonary aspiration. Since gastric emptying is not delayed by recent Colles' fracture, the simple precaution of fasting patients prior to IVRA should reduce the risk of pulmonary aspiration in such circumstances.

ACKNOWLEDGEMENTS

We would like to thank Mrs E. MacDonald for typing the manuscript.

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